## REMARKS

In the Office Action dated September 3, 2009, and marked final, the Examiner withdraws his 102 U.S.C. § 102(b) rejection and the previous 35 U.S.C. §103 rejections. However, the Examiner now rejects (1) claims 1, 4-14 and 20-23 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu (2004/0126655) in view of Delnick (5,865,860); (2) claim 3 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu in view of Delnick and in further view of Kung (5,389,471); and (3) claims 15, 16, 24 and 26 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu in view of Delnick and in further view of Triplett (3,566,985).

Claims 2, 17-19 and 28-29 were previously canceled. With this Response, no claims are added, canceled or amended. After entry of this Response, claims 1, 3-16 and 20-27 remain pending in the Application. Reconsideration and entry of the Application is respectfully requested in light of the arguments made below.

*Rejection of claims 1, 4-14 and 20-23 under 35 U.S.C. §103(a)*

The Examiner rejects claims 1, 4-14 and 20-23 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu (2004/0126655) in view of Delnick (5,865,860).

Claim 1 (and claims 3-9, 20 and 21 that depend therefrom) recites in part individual insulating particles having a plurality of interstitial spaces therebetween, with electrolytes occupying at least some of the interstitial spaces. Each individual insulating particle in the pattern is selectively arranged directly on one of the cathode and anode, the individual insulating particles arranged such that the cathode and the anode do not contact each other.

The Examiner contends that Hisamitsu discloses all of the elements of claim 1 except for an electrolyte layer consisting of a pattern of individual insulating particles with electrolytes occupying the interstitial spaces. (Office Action, p. 4). The Examiner is correct, as Hiramitsu discloses the manufacture of a film layer electrolyte. As noted in paragraph [0039], "[a]fter a solvent contained in the fluid is evaporated and the fluid is solidified, each of the fluid types is ejected to overlay the solidified fluid in a predetermined pattern to be formed next. Here, after the fluid is applied, it is preferable to perform heat or optical treatment for the film (the

layer) formed by the fluid in order to accelerate evaporation of the solvent or solidification of the fluid. By repeating these operations for predetermined times, a desirable laminate type battery is manufactured." As we have previously noted, Applicants are not disclosing a film for an electrolyte layer.

The Examiner contends that Delnick discloses a battery comprising an electrolyte layer comprising a porous separator structure with individual insulating particles of silica or alumina and a polymer binder wherein electrolytes are applied via ink-jet printing. (Office Action, p. 4). Delnick indeed discloses a porous separator structure. "The separator layer 208 is made of a suitable mixture of a solid particulate, such as alumina or silica, and a polymer binder." (Col. 5, ll. 45-47). The separator is clearly a "layer" as shown in Fig. 2 and as disclosed in the specification in col. 5, ll. 20-35 as follows.

> [T]he preferred porous layer 204 may comprise a bilayer structure which is comprised of a first layer 206 and a second layer 208. The first layer 206 comprises an electrode layer, for example an anode active electrode, disposed directly on the current collector substrate 202. The second layer comprises a separator layer 208 formed on top of the first layer 206 and having an upper surface 207. The first layer 206 and the second layer 208 form an interface 209 at their adjoining surfaces. The porous structure of the second layer 208 continuously extends into the first layer 206 through the interface 209. Although, the preferred embodiment comprises a bilayer structure 204, it is to be understood that the use of a single-layer is also within the scope of this invention. In this case, the porous layer 204 may only comprise the active electrode layer 206.

Important in that disclosure is the upper surface 207 of the separator layer 208 that continuously extends into the first layer 206 through the interface 209. Clearly, this separator is not intended to keep the cathode and anode from contacting each other, as it penetrates into the electrode layer. In addition, if only one layer is to be used, it will be the electrode layer, thereby eliminating the separator layer, essentially disclosing that of Hisamitsu.

Delnick clearly does not disclose individual insulating particles having a plurality of interstitial spaces therebetween, with electrolytes occupying at least some of the interstitial spaces. Each individual insulating particle in the pattern is ***selectively arranged directly on one***

*of the cathode and anode,* the ***individual insulating particles arranged such that the cathode and the anode do not contact each other.***

Because neither Hisamitsu nor Delnick disclose the individual insulating particles as recited in claim 1, the combination does not teach, suggest or render obvious to one skilled in the art the use of insulating particles as recited in the claim. Applicants respectfully submit that claim 1 and its dependent claims 3-9, 20 and 21 are allowable over the cited combination.

In addition to its dependency from an allowable claim, claim 4 includes additional features that make it allowable over the cited combination of references. Claim 4 describes that a mean radius of the individual insulating particles is 0.05-10 μm. The Examiner refers to paragraph [0048] of Hisamitsu as stating that the particle sizes of the battery materials should be 5 microns or smaller. However, as admitted by the Examiner, Hisamitsu does not disclose the use of insulating particles. Therefore, the invention of claim 4 is not rendered obvious by the cited combination.

In addition to its dependency from an allowable claim, claim 5 includes additional features that make it allowable over the cited combination of references. Claim 5 describes that a thickness of the electrolyte layer is 10 μm or less. The Examiner states that Delnick discloses the electrolyte layer between 5-20 microns. However, Delnick actually discloses that the separator layer 108 is 5-20 microns, not the electrolyte layer. Therefore, the invention of claim 5 is not rendered obvious by the cited combination.

In addition to its dependency from an allowable claim, claim 7 includes additional features that make it allowable over the cited combination of references. Claim 7 describes that the individual insulating particles comprise olefin resins. The Examiner does not address this claim in the Office Action. Hisamitsu does not disclose insulating particles, and Delnick discloses a mixture of solid particulate such as alumina or silica. As neither reference discloses an olefin resin, the invention of claim 7 is not rendered obvious by the cited combination.

In addition to its dependency from an allowable claim, claim 20 includes additional features that make it allowable over the cited combination of references. Claim 20

describes that the arrangement of individual insulating particles is a patterned arrangement. Hisamitsu does not disclose insulating particles, and Delnick discloses first applying the separator layer to the electrode rather than individual particles, as noted above. Therefore, the invention of claim 20 is not rendered obvious by the cited combination.

Claim 10 (and claims 11-14, 22 and 23 that depend therefrom) recites a method for manufacturing a battery comprising applying individual insulating particles directly to at least one of a cathode and an anode, applying an electrolytic polymer to at least some of a plurality of interstitial spaces between the individually applied insulating particles to form an electrolyte layer and layering the cathode and the anode such that the electrolyte layer is formed in between.

As noted by the Examiner on page 5 of the Office Action, Hisamitsu does not disclose the claimed method. The Examiner contends, however, that Delnick discloses the method. As explained above, Delnick discloses forming a separator layer 208 having an upper surface 207. Delnick does not disclose applying individual insulating particles directly to the electrode. Accordingly, the combination of Hisamitsu and Delnick fail to teach, suggest or render obvious at least that element of claim 10. Applicants respectfully submit that claim 10 and its dependent claims 11-14, 22 and 23 are thus allowable over the cited combination.

In addition to its dependency from an allowable claim, claim 12 includes additional features that make it allowable over the cited combination of references. Claim 12 describes that the electrolytic polymer is applied simultaneously with the individual insulating particles to form a solid electrolyte battery. Hisamitsu does not disclose insulating particles, and Delnick discloses first applying the separator layer to the electrode, as noted above. Therefore, the invention of claim 12 is not rendered obvious by the cited combination.

In addition to its dependency from an allowable claim, claim 14 includes additional features that make it allowable over the cited combination of references. Claim 14 describes that a thickness of the electrolyte layer is 10 μm or less. The Examiner states that Delnick discloses the electrolyte layer between 5-20 microns. However, Delnick actually

discloses that the separator layer 108 is 5-20 microns, not the electrolyte layer. Therefore, the invention of claim 14 is not rendered obvious by the cited combination.

In addition to its dependency from an allowable claim, claim 22 includes additional features that make it allowable over the cited combination of references. Claim 22 describes that the arrangement of individual insulating particles is a patterned arrangement. Hisamitsu does not disclose insulating particles, and Delnick discloses first applying the separator layer to the electrode rather than individual particles, as noted above. Therefore, the invention of claim 22 is not rendered obvious by the cited combination.

*Rejection of claim 3 under 35 U.S.C. §103(a)*

The Examiner rejects claim 3 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu in view of Delnick and in further view of Kung (5,389,471). Claim 3 depends from claim 1 to include all of the limitations therein and to further recite that a void ratio of the interstitial spaces to the individual insulating particles in the electrolyte layer is 50-90%. As the Examiner notes on page 7 of the Office Action, neither Hisamitsu nor Delnick disclose this limitation. As explained earlier, neither Hisamitsu nor Delmick disclose individual insulating particles having a plurality of interstitial spaces therebetween, with electrolytes occupying at least some of the interstitial spaces. Therefore, for the combination of Hisamitsu, Delnick and Kung to render claim 3 obvious, Kung must cure the deficiencies of Hisamitsu and Delnick. However, Kung also fails to disclose individual insulating particles having a plurality of interstitial spaces therebetween, with electrolytes occupying at least some of the interstitial spaces. Therefore, the cited combination of references does not teach, suggest or render obvious the elements of claim 3. Applicants respectfully submit that claim 3 is allowable over the cited combination for these reasons.

*Rejection of claims 15, 16, 24 and 26 under 35 U.S.C. §103(a)*

The Examiner rejects claims 15, 16, 24 and 26 under 35 U.S.C. §103(a) as being unpatentable over Hisamitsu in view of Delnick and in further view of Triplett (3,566,985).

Claims 15 and 16 (and claims 24 and 26 by their dependency) recite in part a battery assembly comprising multiple connected batteries, wherein each of the connected batteries comprises an electrolyte layer consisting essentially of individual insulating particles individually applied directly to at least one of the cathode and the anode and affixed thereto, and electrolytes occupying at least some of a plurality of interstitial spaces between the individual insulating particles.

Triplett is cited for the electric vehicle driven by an electric motor powered by a DC battery having a plurality of cells. However, as explained above, neither Hisamitsu nor Delnick, alone or in combination, teach, suggest or render obvious an electrolyte layer consisting essentially of a pattern of individual insulating particles and electrolyte, each individual insulating particle in the pattern being selectively arranged directly on one of the cathode and anode as recited in claims 15 and 16. Triplett in combination with these two references fails to cure this deficiency as Triplett also fails to teach or suggest such an electrolyte layer. Applicants therefore respectfully submit that claims 15 and 16, and claims 24 and 26 by their dependency, are allowable.

In addition to their dependency from allowable claims, claims 24 and 26 include additional features that make them allowable over the cited combination of references. Claims 24 and 26 describe that the arrangement of individual insulating particles is a patterned arrangement. Hisamitsu does not disclose insulating particles, and Delnick discloses first applying the separator layer to the electrode rather than individual particles, as noted above. Triplett in combination with these two references fails to cure this deficiency. Therefore, the invention as recited in claims 24 and 26 is not rendered obvious by the cited combination.

*Conclusion*

Reconsideration of the Application is requested. It is respectfully submitted that this Response places the application in suitable condition for allowance; notice of which is requested.

Applicants further submit that, to the extent the Examiner disagrees, the Examiner should issue a further Office Action as the Office Action dated September 3, 2009 fails to examine claim 7.

If the Examiner feels that prosecution of the present Application can be expedited by way of an Examiner's amendment, the Examiner is invited to contact undersigned at the telephone number listed below.

Respectfully submitted,

YOUNG BASILE
HANLON & MACFARLANE, P.C.



Francine B. Nesti
Registration No. 53376
(248) 649-3333

3001 West Big Beaver Road, Ste 624
Troy, Michigan 48084-3107